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Strategic Policy

The National Graduates Surveys

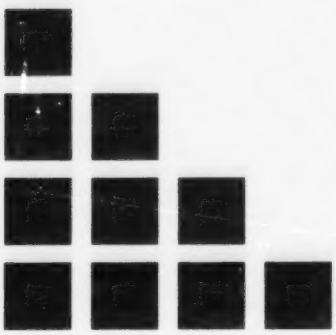
Does the Straight and Narrow Pay? The Path to a Degree and Labour Market Outcomes

R-00-2-1E

by
Ted Wannell, Bert Pereboom and Laval Lavallée

2000

Research Paper



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This report is part of a set of research studies on the National Graduates Surveys.
Le présent rapport fait partie d'un ensemble d'études sur les Enquêtes nationales auprès de diplômés.

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Abstract

The research reflected in this paper attempts to distinguish between the typical route to an undergraduate degree and a more indirect path marked by part-time study, raising children, or graduation after the age of 25. With some evidence of an increased tendency for students to take the more indirect route to a university degree, and a concern that rising tuition rates may make the traditional path more difficult to follow, our central question is whether the indirect path is associated with notable disadvantages in labour market outcomes. We analyze this question by examining data on both men and women graduates from three panels of the National Graduates Surveys.

Based on our analysis, we find little economic penalty or public policy concern associated with pursuing an indirect route to an undergraduate degree instead of the more conventional direct route. Whatever additional human capital a person obtains pursuing an indirect route to a degree appears to be compensated in the labour market. More positively, those who are unable to follow a direct path to an undergraduate degree should not fear that they would be stigmatized in the labour market for not sticking to the straight and narrow path to higher education.

Résumé

Ce document de recherche tente d'établir une distinction entre le parcours type en vue de l'obtention d'un diplôme de premier cycle et un parcours moins suivi, caractérisé par des études à temps partiel, l'éducation d'enfants ou l'obtention d'un diplôme après l'âge de 25 ans. Étant donné la tendance plus marquée chez les étudiants à suivre un autre genre de parcours pour obtenir un diplôme universitaire et les frais de scolarité croissants qui ne permettent pas toujours de poursuivre des études supérieures de manière soutenue, nous voulons principalement déterminer si la voie non traditionnelle suppose des désavantages considérables sur le marché du travail. Nous procédons donc à une analyse par l'examen de données sur des diplômés hommes et femmes ayant été sélectionnés dans trois panels des Enquêtes nationales auprès des diplômés.

Selon notre analyse, l'obtention d'un diplôme de premier cycle de manière non traditionnelle plutôt que traditionnelle présente peu de désavantages économiques ou de préoccupations d'intérêt public. Il y aurait compensation sur le marché du travail pour tout capital humain acquis par une personne suivant ce genre de parcours. Par ailleurs, ceux qui ne peuvent poursuivre des études supérieures de premier cycle de la manière habituelle n'ont pas à craindre d'être dépréciés sur le marché du travail parce qu'ils ont procédé autrement.

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Executive Summary

The research reflected in this paper attempts to distinguish between the typical route to an undergraduate degree and a more indirect path marked by part-time study, raising children, or graduation after the age of 25. With some evidence of an increased tendency for students to take the more indirect route to a university degree, and a concern that rising tuition rates may make the traditional path more difficult to follow, our central question is whether the indirect path is associated with notable disadvantages in labour market outcomes. We analyze this question by examining data on both men and women graduates from three panels of the National Graduates Surveys.

We began our analysis with a logistic regression model that estimated the relative importance of various factors that might influence whether graduates might take a direct or indirect path to a university degree. The results suggest that male students following an indirect path are more likely to have faced financial constraints as proxied by borrowing money to complete studies. Among women, however, those who pursued a *direct* path to a degree were more likely to have borrowed money. Further, we found that high educational attainment of parents is positively correlated with the direct study path, though we found a stronger, more consistent influence for women than men. Graduates in fields of study typically leading to high earnings were more likely to follow a more direct path to a degree. Students, both male and female, from Western Canada were more likely to pursue the indirect path, while language spoken at home did not seem to have a consistent influence on the path to a degree.

Our comparisons of direct versus indirect graduates showed the following differences:

- direct graduates were more likely to concentrate in quantitative fields of study while indirect graduates were more focused on the humanities and arts, with the pattern holding for both men and women.

- differences in marital and family status are clearly linked to the selection criteria underlying the direct/indirect distinction, so it comes as little surprise that the indirect group are more likely to be married and have children than the direct group, both two and five years after graduation. Those following an indirect path to an undergraduate education were less likely to continue on to graduate study, both among men and women.

- Among both men and women, the indirect group was much more likely to be in teaching occupations, likely a consequence of regulatory changes that raised the educational requirement for teachers to a BA from a teaching certificate.

- Indirect graduates have considerably higher earnings than direct graduates two years after graduation, though the gap narrows during the two and five year post-graduation period. This pattern varies somewhat by occupation, with the more math-oriented fields of study showing

less of an earnings penalty for direct graduates, and the arts and humanities fields apparently rewarding other forms of human capital gained via an indirect route to a degree.

The final section of the paper sought to decompose the earnings differences between the indirect and direct groups as well as the male/female differences. This analysis is complicated by the fact that the NGS offers little information on the work experience prior to graduation, meaning that the indirect group is more likely to have additional "unobserved" human capital relative to their counterparts in the direct group. The earnings trajectories of the two groups would appear to converge at some point beyond five years after graduation, as the experience advantage of indirect graduates diminishes in importance.

Both the direct and indirect paths to a degree show the market is coming to value the characteristics of men and women more equally at the two-year observation point. Similarly, for both direct and indirect graduates, the gender gap widens during the following three-year interval. Over time, however, even the gender gap evident five years after graduation appears to be shrinking, to roughly 5 percent for female indirect graduates relative to their male counterparts; and to roughly 4 percent for female direct graduates relative to their male counterparts.

Based on our analysis in this paper, there appears to be little economic penalty or public policy concern associated with pursuing an indirect route to an undergraduate degree instead of the more conventional direct route. Whatever additional human capital a person pursuing an indirect route to a degree obtains along the way appears to be compensated in the market. More positively, those who are unable to follow a direct path to an undergraduate degree should not fear that they would be stigmatized in the labour market for not sticking to the straight and narrow path to an education.

The limitations to this analysis include the fact that we focus only on the first five years after graduation and do not take a lifetime returns perspective on the question of returns to investment in education. A lifetime returns perspective would place obvious limits on assertions that it doesn't really matter when you finish your degree. For example, if education were seen exclusively as an economic investment to generate higher earnings over a lifetime, it would make sense to earn the degree early, rather than five years before retirement.

1. Introduction

Young people are generally encouraged to stay in school and to obtain as much education as they can take to maximize lifetime employment and earnings opportunities. For university graduates, a common, though not universal, path is the direct, uninterrupted route through primary and secondary school, followed by a Bachelors' degree usually earned after four years of full-time university study. At ages between 21 and 23, graduates present themselves to the labour market, and new careers are launched.

Not every university graduate follows this direct path, however, and this paper aims to examine the implications of straying from the direct path. An assumption that the direct route is the better route in the long term is not obvious. Recent newspaper stories have suggested that rising tuition rates and increasing student loan debt burdens are making it more difficult for young people to complete a university education without taking time off to work. On the other hand, newly minted students with little to write in the "Experience" section of their resumes seem to have more difficulty finding work, and many employers indicate a strong preference for candidates with experience. In this paper, we seek to distinguish between direct and indirect paths to a bachelors' degree and examine the early labour market experiences of both men and women graduates using data from three panels of the National Graduates Surveys.

Many past studies of graduates' earnings, and earnings in general, devote much attention to controlling for pre-university work experience. Controlling for work experience when using the NGS is difficult due to sparse information available on the quantity and quality of previous experience, and some inconsistencies in the manner in which the data were collected from cohort to cohort. This paper takes a different approach. We identify a simple dichotomy between students who took a fairly direct route from secondary matriculation to their Bachelors' degree and all others. The direct group is defined as those who studied only full-time in attaining their degree and were under age 25 and had no children at the time of graduation. This defines homogenous cohorts of graduates whose human capital at graduation consist primarily of their degree and who are unencumbered by parental responsibilities.

We considered including marriage in the criteria, but the NGS only contains information on marital status two years and five years after graduation. It is impossible to tell whether they were

married at the time of graduation. Marriage probably does not encumber careers in the same way that childbearing does.

This dichotomy creates some interesting analytical possibilities. First, it allows gender comparisons within the more homogeneous direct group and the more heterogeneous indirect group. One would expect that, all other things being equal, gender differentials in earnings and other labour market outcomes would be minimal in the direct group, though perhaps somewhat greater in the indirect group because of differing underlying causes of shifting to an indirect path.

The other interesting comparison is between the direct and indirect groups of each gender. How do these groups differ in background? In selected field of study? In continuing education? Are their labour market outcomes different?

In the remainder of this paper, we first position the work within the literature on male/female earnings differentials and on early labour market experiences of university graduates. We then document the trends in direct versus indirect paths to earning a university degree, based on three cohorts of students drawn from the National Graduates Surveys of the classes of 1982, 1986, and 1990. The following section takes a closer look at the field of study, occupation, and earnings of those following indirect or direct paths to identify any systematic differences among those who follow different paths to a degree. We then examine the earnings outcomes of the two groups, for both males and females to ascertain whether the labour market favours one path or the other. Our findings suggest that those following the indirect path tend to receive higher wages than those following the direct path in the early years after graduation, though inability to control completely for previous labour market experience forces us to be tentative with such a conclusion.

2. Human Capital, Education Paths and Earnings Differentials

This paper draws on two strands in the human capital and earnings literature, one with an extensive catalogue developed over many decades, and the other relatively new and underdeveloped. The first is the voluminous literature on male-female earnings differentials and the search for evidence on whether differentials reflect differences in the underlying endowments of human capital or a systematic undervaluing of those endowments for, most typically, females in the labour market. The less-developed strand of the literature deals with the nature of the path through higher education, and its impact on subsequent earnings.

Human capital theory suggests that earnings differentials can be partly explained by differences in human capital, roughly defined as one's ability to carry out valuable market activity. Human capital is typically thought of as a combination of natural ability, work ethic and similar concepts, as well as skills and abilities, developed chiefly through education, training, and work experience. Theories on the impact of an education on earnings include the possibility that education enhances the ability to perform valuable work, and the possibility that a degree signals to employers that the graduate has the ability to pass certain, screens, hoops and challenges and this, perhaps more than the knowledge obtained, is seen as valuable in the labour market.[1]

Earnings depend on a host of other factors, of course, and this paper also seeks to explore male/female differences in earnings, and whether differences in education paths can explain any part of these differentials. Documentation of earnings differentials between males and females in Canada has an extensive history. The dramatic increase in female labour force participation in the sixties and seventies saw rates for women over the age of 25 nearly double from 24 percent in 1960 to 47 percent in 1980. This development triggered a number of studies documenting male/female differences in access to jobs, promotions, and the distribution of earnings (see, for example Boulet and Lavallée (1981) and (1984)).

Wannell and Caron (1994a,b) used the National Graduates Surveys (NGS) on 1982, 1986, and 1990 graduates to show a narrowing of the male/female earnings gap during last decade, particularly among university graduates. Male annual earnings are generally higher than women

[1] See almost any labour economics textbook for additional discussion. See for example, Ehrenberg and Smith (1985).

but men tend to work more hours per week than women. After controlling for hours of work, hourly wages for female university graduates exceeded those of males in the 1990 cohort.

More recent work on gender earnings differences among university graduates includes Finnie and Wannell (1999). The authors use the NGS data to show that while the male/female earnings gap two years after graduation has essentially been eliminated with the most recent cohort, extending the analysis to five years after graduation shows that the gender gap has been increasing over time. Significant differences in hours worked between males and females explain some of the gap, the authors point out the need to search for other underlying causes of the gap.

The second strand of literature is much less developed, drawing notably on two recent papers by Michael Hilmer (1999a and 1999b). In these papers, Hilmer examines the impact on entry level wages of attending a two-year college in the United States prior to completing a bachelors' degree at another college or university. Hilmer finds no significant differences in earnings between those who did and those who did not attend the two-year junior colleges, even though tuition at junior colleges is significantly less than at the more conventional four-year colleges.

In this paper, we use the technique of segmenting the incoming cohort of graduates, to seek out evidence of other underlying causes of the gender earnings gap as well as the impact of the path through education. In particular, we examine the hypotheses that the path taken to earn an undergraduate degree plays some role in explaining early labour market experiences and outcomes.

Silver, Lavallée and Pereboom (2000) use a similar style of analysis as that employed in this study. They define groups based on post-graduation labour market experience to determine whether poor labour market outcomes soon after graduation have a negative impact later in the career. They find that those who find early success in the labour market following completion of post-secondary studies are more likely than others to remain with the initial employer and to achieve higher earnings levels over the post-graduation period. Those who move about among employers or whose employment is interrupted fare less well.

In this study, we segment the cohorts not by early labour market experience, but by the path taken to the undergraduate degree. We divide the sample into four segments, direct and indirect, and by women and men, to allow decomposition of differences both by path and by gender.

3. Defining the Direct and Indirect Paths to a Bachelor's Degree

The National Graduates Surveys

The National Graduates Surveys (NGS), sponsored by Human Resources Development Canada and conducted by Statistics Canada, are specifically designed to obtain information on the relationship between education/training and labour market activities, the long-term labour market experiences of graduates, the employment, earnings, occupation and additional educational experiences and qualifications of graduates. The NGS focus on individuals who had obtained a degree, diploma or certificate from a trade/vocational school, a career/technical college (or CEGEP) or a university, and who were still living in Canada at the time of the survey. The NGS files are representative of the underlying graduate population in Canada.

Background

Statistics Canada conducted a first survey in 1978 on the labour market experiences of 1976 graduates from universities and community colleges in Canada. In 1984, a similar survey, the NGS of 1982 graduates was sponsored jointly by the Department of the Secretary of State and Employment and Immigration Canada and conducted by Statistics Canada. This survey expanded on the content of the previous survey and extended the population base to include graduates of trade/vocational programs in addition to graduates from community colleges and universities.

Since 1982, four cohorts of graduates have been surveyed. Every cohort was interviewed two and five years after graduation.

Year of graduation	First interview	Follow-up interview
1982	1984	1987
1986	1988	1991
1990	1992	1995
1995	1997	2000

The 2000 Follow-up Survey of the 1995 Graduates included a 'brain drain' component. Those who graduated in 1995 but who were living in the United States in June 2000 were included in the survey.

Objectives

The survey's key data objectives are:

- To obtain information for labour market analysis;
- To obtain information on the relationship between education/training and labour market experiences and the exposure of graduates to additional learning opportunities;
- To extend available information required to improve occupational supply and demand projection models and to conduct related studies of supply-demand imbalances in the labour market;
- To extend available information required to improve occupational supply and demand projection models and to conduct related studies of supply-demand imbalances in the labour market;
- To obtain data regarding longer-term market experiences of graduates;
- To obtain information on labour market experiences of members of target groups (such as women, visible minorities, native people, and persons with disabilities);

- To gain a better understanding of school-work transitions and returns to human capital;
- To gain a better understanding of post-secondary education financing;
- To obtain more detailed information on knowledge and skills.

Methodology

The National Graduates Surveys were based on a stratified systematic random sample design. For each province, the graduate population was stratified into five education levels: trade/vocational (skilled trades), career/technical (college), undergraduate, master's level and doctorate. The levels were subsequently stratified into nine fields of study for those who had taken a college program and ten fields for trade/vocational and university graduates. These fields of study classifications were based on the 5-digit USIS (University Student Information System) and CCSIS (Community College Student Information System) codes used by Statistics Canada. The sample allocation to the strata was made to assure acceptable levels of detail and therefore acceptable data reliability for the provinces, education levels and fields of study.

A total sample was selected for every cohort of graduates. Interviewers attempted to contact all graduates in the sample, initially using the telephone numbers provided by their institution. On average for every cohort, 73% of the total sample selected were contacted and interviewed. The same individuals were contacted again for the follow-up interview.

Year of graduation	Total sample selected	Year of survey	Usable sample (response rate)
1982	49,150	1984	35,717 (73%)
		1987	31,167
1986	53,136	1988	40,814 (77%)
		1991	35,401
1990	51,111	1992	36,280 (71%)
		1995	35,816
1995	61,759	1997	43,040 (70%)
		2000	To be completed

For more detailed information on methodology, see:

Clark, Warren, Margaret Laing and Edith Rechnitzer (1986). The Class of 82: Summary Report on the Findings of the 1984 National Survey of the Graduates of 1982, Secretary of State and Statistics Canada.

Clark, Warren (1991). The Class of 1986: A Compendium of Findings of the 1988 National Graduates Survey of 1986 Graduates with Comparisons to the 1984 National Graduates Survey, Employment and Immigration Canada and Statistics Canada, Catalogue LM-198E92.

Little, Don and Louise Lapierre (1996). The Class of 90: A Compendium of Findings from the 1992 National Graduates Survey of 1990 Graduates, Human Resources Development Canada and Statistics Canada, Catalogue SC-125-12-96E.

Taillon, Jacques and Mike Paju (1999). The Class of '95: Report of the 1997 National Survey of 1995 Graduates, Human Resources Development Canada and Statistics Canada, Catalogue SP-121-04-99.

We begin by establishing the criteria for distinguishing between those on the indirect and direct paths to a university degree. These criteria are admittedly somewhat arbitrary, but we began with a characterization of the common path through university: full-time study, no children, and graduation before the age of 25. Table 1 shows the distribution of male and female bachelors' graduates by these characteristics, as captured by the National Graduates Surveys of students who graduated in 1982, 1986, and 1990.

Table 1 **Defining the Direct and Indirect Route to Graduation**

Criteria	Women			Men		
	1982	*1986*	*1990*	*1982*	*1986*	*1990*
Less or equal to 25 years of age at graduation	67.0	70.6	69.4	71.4	75.1	72.1
Studied full-time	73.7	73.2	72.0	78.1	79.7	79.9
No children at graduation	87.8	90.5	91.4	92.4	95.7	97.1
Direct Path: Age less or equal to 25 years at graduation, no kids, studied full-time	57.9	61.8	60.2	60.8	65.4	63.6
Single 2 years after graduation	55.1	58.9	56.8	66.2	68.1	64.7
Less or equal to 25 years of age at graduation, no kids, studied full-time, single	39.6	44.4	42.2	47.9	50.7	48.0

Female graduates tend to be less likely than men to graduate before the age of 25, less likely to have studied full-time, and more likely to have dependent children at the time of graduation. Age is the biggest contributing factor to indirect status for both men and women.[2] Relatively few graduates have children at the time of graduation and the proportion with children has fallen with each cohort, to less than nine percent of female graduates and less than 3 percent of male graduates among the class of 1990.

Combining the three criteria into the concept of direct path – age 25 or less, full-time study, and no dependent children – women are slightly less likely to have taken the direct route to university graduation, with the difference around three percentage points for each cohort. For both men and women, the direct group grew from 1982 to 1986 and then fell in 1990.

[2] Age 25 was chosen as a cut-off since it would give a typical 18 year-old high school graduate just enough time to complete a first professional degree through uninterrupted study. We replicated the models in Table 3 for the 1990 cohort using alternative age cut-offs of 24 and 26, with little change in the results.

Thus the evidence for a time trend is mixed, with a large increase in the proportion of students who pursued a direct path between in the 1986 cohort over the 1982 cohort, a small increase in the indirect proportion in the cohort graduating in 1990. This pattern may indicate some influence of the business cycle on the choice of the indirect or direct path, though the number of data points are insufficient to draw conclusions. Note that the 1986 cohort would have been in school during the relatively high unemployment period of the early 1980s, suggesting that a poor economy contributes to an increased likelihood of pursuing a direct path.

Adding marriage to the criteria would markedly shrink the direct group and increase the male-female differences. The female direct group would shrink by about 18 percentage points in each cohort, while the male direct group would shrink by about 14 percentage points. Since marital status was only collected at the time of each survey, two years after graduation, it is impossible to determine whether respondents were married before or after graduation. Due to this element of uncertainty, this paper will adopt the first definition of direct status, and exclude marital status from the definition.

Table 2 **Age Group Distribution of Bachelors' Graduates by Gender**

	1982		1986		1990	
Age at Graduation	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
Less than 25 years of age	61.1	63.6	68.0	65.7	62.2	60.9
25-29 years of age	26.9	16.0	18.8	12.9	23.9	17.4
30-34 years of age	6.8	6.9	5.1	6.1	6.8	6.8
35 years of age and older	5.3	13.5	8.2	15.4	7.0	14.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Men vs. Women Average Absolute Difference	*5.4*		*4.1*		*3.9*	
Mean Age	25.6	27.0	26.0	26.9	26.1	27.3
Median Age	24.0	23.0	23.7	23.3	24.2	24.0

Though we hope to designate a relatively homogenous population of direct graduates, readers should note the heterogeneity of the non-direct graduates, particularly with respect to age and gender. A far greater proportion of women in each cohort were age 35 or older at the time of graduation: 2.5 times as great in 1982, 1.9 in 1986 and 2.1 in 1990. The differences in the age distributions of men and women are converging slowly over time as measured by the average

absolute difference in proportions[3] and the median age. There is no trend in the difference of average ages, but this measure would be more affected by the skewness of the distributions.

While age is a defining criterion in the determination of the direct and indirect paths to graduation, there are a number of other factors that may influence which path an individual follows. The remainder of this section presents the results of a logistic regression model that estimates the relative importance of various factors, which might point an individual down one path or another. Since the study path is presumably determined before the individual begins his post-secondary studies (or at the latest, very early in his academic career), the model contains only information on their pre-university situation – or reasonable proxies. These factors are briefly described below.

- Financial constraints are hypothesized to push students toward the indirect study path. They are proxied by information on whether the student borrowed money to complete their studies.

- Parents' socio-economic status (SES) is postulated to influence students towards the direct study path in two ways. First, SES should be a secondary indicator of financial situation – high parent SES would be associated with fewer financial constraints. Second, there is a socialization factor in that children's educational attainment is related to their parents' attainment.[4] Thus high parent SES should be positively correlated with the direct study path. Educational attainments of parents are the only SES variables available in the graduates surveys and are implemented in the model through indicators of post-secondary degree or diploma attainment of mothers and fathers.

- Secondary school performance should also be correlated with the direct study path. Since no information is available on secondary school grades, we assume that high marks would be associated with acceptance into a competitive field of study. Moreover, competitive fields should be those that lead to the highest earnings. Thus we classified the fields of study in each cohort by approximate tertiles of post-graduation earnings. Some arbitrary reassignments were made where the average earnings of cusp fields were closer to the

[3] The average absolute difference is calculated exactly as the name would indicate – the absolute differences in the male and female proportions are summed and divided by the number of categories.

[4] For a further discussion of this issue, see de Broucker and Lavallée (1998b).

adjacent grouping than the others in its original tertile. So the working hypothesis is that those entering high earnings fields of study are more likely to follow the direct study path.

- Regional variables are used to control for differences in secondary education systems and post-secondary opportunities. Similarly, language indicators are used to control for any differences in post-secondary opportunities related to the predominance of English institutions in Canada.

Table 3 **The Relative Odds of Taking the Direct Study Path**

	Men			Women		
Criteria	*1982*	*1986*	*1990*	*1982*	*1986*	*1990*
Borrowed Money to Attend School						
Borrowed money	0.70ξ	0.61ξ	0.86	1.37ξ	1.14	1.35ξ
Did not borrow money	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
Father Has a Post-secondary Degree or Diploma						
Father has post-secondary degree	1.15	1.21	1.26ξ	1.24ξ	1.34ξ	1.68ξ
Father does not have a degree	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
Mother Has a Post-secondary Degree or Diploma						
Mother has post-secondary degree	1.23	1.14	1.49ξ	1.39ξ	1.44ξ	1.48ξ
Mother does not have a degree	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
Fields of Study						
Low earnings field of study	0.98	0.76ξ	0.99	0.81ξ	0.89	1.00
Medium earnings field of study	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
High earnings field of study	2.05ξ	1.60ξ	1.48ξ	1.40ξ	1.20	1.22ξ
Regions						
Atlantic	0.93	0.89	0.90	0.97	0.85	0.92
Quebec	0.64ξ	0.76	0.91	0.74	0.82	0.95
Ontario	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
Prairies	0.77ξ	0.76ξ	0.66ξ	0.69ξ	0.83	0.62ξ
B.C. & Territories	0.73ξ	0.86	0.65ξ	0.60ξ	0.68ξ	0.73ξ
Language Spoken at Home						
English	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ	1.00ξ
French	1.49ξ	1.18	0.93	1.02	0.88	0.98
Other language	0.61ξ	0.79ξ	1.01	0.94	1.10	1.04

Note: ξ indicates statistical significance at .05 level for the coefficients.

The model was estimated using a logistic regression procedure with the resulting coefficients converted into odds ratios. Within each set of indicator variables, one category is omitted and becomes the reference point for other categories. So the relative odds of taking the direct study

path for each reference category is one (1.0).[5] A value below one indicates that individuals with that characteristic are less likely to be direct students; a value above one indicates the opposite. An ξ signifies that the difference from the reference group is significant at the .05 level.

The results in Table 3 confirm all our hypotheses, with one major exception. Contrary to what was expected, women who borrowed money to finance their education were more likely to follow the direct study path. One possible explanation is that the generally married indirect students may have had more spousal financial support than the generally single direct students. In contrast, male students who borrowed money were far less likely (between 14 and 39 percent) than non-borrowers to take the direct study path.

The parental education indicators had a stronger and more consistent influence on study path of women.[6] Female graduates whose parents had a post-secondary degree or diploma were at least a quarter and up to 68 percent more likely to follow the direct path compared to women whose parents had lower educational attainment. Although there was always a positive relationship between parents' education and the direct study path for men, the relationship was not statistically significant for the first two cohorts. For both men and women, the relationship between parents' education and the direct study path is strengthening across subsequent cohorts. This trend may well be related to higher tuition costs: students from higher SES families could be better able to bear the costs of the direct study route in a higher cost environment.

The hypothesis relating average field of study earnings to study path was also strongly confirmed, particularly for men. Men in high earnings fields of study were about 50 to 100 percent more likely than men in low earnings fields of study and at least 50 percent more likely than those in mid earnings fields of study to take the direct study path. The differences were somewhat smaller for women, yet still significant in each cohort.

Among the remaining controls, students from provinces west of Ontario were consistently and significantly less likely than Ontario residents to follow the direct study path. This may be related to the greater availability of university preparation courses in community colleges in those

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5 In the discussion following, we convert odds ratio to percentages by subtracting one and multiplying by 100.

6 See, for instance, de Broucker and Lavallée (1998a) and (1998b).

provinces, which could bring more mature students back to university. The language results were less consistent. French speaking male students were more likely and French speaking female students were less likely to follow the direct path in the 1986 cohort, but had nearly identical propensities to English speaking students in the 1990 cohorts. Similarly, male anglophones in the 1982 cohort were underrepresented in the direct study path, but this too seemed to be an isolated result.

4. Different Paths, Different Destinations?

Our analysis so far has focussed on differences in the backgrounds or circumstances of indirect and direct graduates. In this section we take a closer look at differences in labour market and life outcomes of the two groups. By comparing the two groups in this way we seek to gain a better understanding of the permanent influence that a more indirect route to an undergraduate degree might imply.

4.1 Field of Study Differences

There are clear differences in major field of study between those who took the direct or indirect route to graduation, as shown in Table 4. Direct students are more likely to graduate from quantitative fields such as sciences, math, engineering and to some extent medical and health professions and commerce, law and economics. The only exception to this rule is in the medical and health field for men and that may simply be an artefact of the length of time it takes to achieve a medical degree. Remember that the direct group only includes those who graduated by the age of 25. This likely excludes many medical professionals who studied full-time without any breaks following secondary school, but due to the length of the program did not graduate until after age 25. The same phenomenon is not as evident for women since a much larger proportion of female health graduates attained nursing degrees, which do not require the same number of years of study as the diagnostic professions.

The average absolute differences indicate that indirect-direct differences in field of study are somewhat greater for men than for women. For both men and women, there seems to be a weak trend towards convergence in field of study choice over time.

The gender differences in field of study patterns are much greater than the indirect-direct differences within genders. The gender differentials are always greater for the direct group than the indirect group, although the differences are slowly attenuating for both groups.

The gender differences are the same that have been noted elsewhere (for example, Wannell and Caron (1994b); Finnie and Wannell (1999). Men are more concentrated in engineering, math, physics, economics, commerce and law. Women are more likely to graduate from education,

fine arts and humanities. These patterns are changing very slowly, with some increased female presence noted in agricultural and biological sciences, economics, commerce and law.

Table 4 **Field of Study Distribution by Gender and Study Path**

	1982 Graduates		1986 Graduates		1990 Graduates	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men – *Field of Study*						
Unknown	---	0.9*	4.7	4.0	4.7	2.5
Education	14.7	8.4	13.6	7.1	14.4	9.6
Fine arts and humanities	15.9	9.4	17.3	10.6	14.8	11.2
Commerce, law and economics	24.3	26.0	18.8	23.8	23.5	25.2
Other social sciences	15.6	13.7	15.3	11.7	17.0	13.2
Agriculture and biological sciences	4.1	7.4	4.6	7.4	3.9	7.8
Engineering	10.0	19.8	12.4	19.9	9.6	15.9
Medical and health professions	5.3	4.5	1.8*	2.0	4.6	4.3
Mathematics and physical sciences	7.1	9.9	11.4	13.6	7.4	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Direct vs. Indirect Average Absolute Difference	3.9		3.9		3.3	
Women – *Field of Study*						
Unknown	2.7*	1.5*	4.1	3.8	4.7	2.3
Education	25.8	23.5	20.8	17.9	24.2	18.8
Fine arts and humanities	24.5	17.0	24.9	17.3	18.0	16.4
Commerce, law and economics	11.5	13.8	12.3	14.7	14.0	17.1
Other social sciences	21.5	19.8	22.1	22.9	23.3	21.5
Agriculture and biological sciences	3.6	7.9	3.5	7.4	4.4	8.5
Engineering	0.6*	2.3	1.4*	2.7	0.9*	2.5
Medical and health professions	7.9	10.6	6.9	8.2	8.5	9.0
Mathematics and physical sciences	2.0	3.7	3.9	5.1	2.0	3.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Direct vs. Indirect Average Absolute Difference	2.8		2.4		2.5	
Men vs. Women Average Absolute Difference	*6.2*	*8.0*	*5.9*	*7.8*	*5.2*	*6.3*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent. Dashes (---) indicate data that cannot be reported because the CV is above 33 percent.

4.2 Marriage and Family Differences

Being older on average, far more indirect graduates are married compared to direct graduates. However the gap in marriage rates for each cohort begins to close substantially within 5 years of

graduation, particularly for women. Two years after graduation, the proportion of indirect male grads that are married is roughly double the proportion found in the direct group. By five years after graduation, the ratio is down to about 4 to 3. Similarly, women who followed the indirect route were close to twice as likely to be married two years after graduation as those who took the direct route. By five years after graduation, the ratio had dropped to 6 to 5 and more than half of the women in each cohort were married.

Comparing men and women within study paths, women were nearly always more likely to be married. The two exceptions are the indirect group in the 1982 cohort, in which the marriage rates of men and women nearly equal in 1984, and marriage rates of men exceeded that of women in 1987, five years after graduation. Among women, there appears to be an increasing tendency to marry in the early years following graduation, while there is no clear trend for men.

Since the absence of children at graduation was one of the selection criteria into the direct group, it is not surprising to see great differences in parenthood rates between the groups in the early years following graduation. Among the direct group in each cohort, about three to four percent of men and women had become parents in the first two years following graduation. Among the indirect group, nearly 40% of the women and nearly 30% of the men were parents two years after graduation (remember that many had been parents for quite some time). No clear trends across cohorts are discernible at the first interview, two years after graduation.

By five years after graduation, the incidence of motherhood is clearly increasing across all cohorts and those in the direct path are clearly catching up to those in the indirect path(see Table 6, last panel). The proportion of women with children increased by about five to nine percentage points among the indirect relative to the two year observation, while the incidence of motherhood among those in the direct groups rose between 12.1 and 16.4 percentage points. Thus the increasing trend for women to marry in the first five years after graduation is accompanied by an increase in childbearing. This should not necessarily be interpreted as an increase in fertility among university graduates, since the proportion of women who have children before graduation has been on the decline (see Table 1). Note that the percentage of men with children five years after graduation is almost always lower than that of women, the sole exception being those in the direct category who were graduates in 1982, where the incidence of fatherhood, at 18.0 percent,

exceeded the incidence of motherhood, at 15.9 percent. There is no clear trend in fatherhood rates.

Table 5 **Marital Status Distribution by Gender and Study Path**

Marital Status	1984		1988		1992	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Two years after graduation*						
Married	51.4	23.7	42.8	21.1	48.6	20.8
Single	45.4	76.0	49.5	78.2	46.8	78.7
Other	3.2*	0.3*	7.7	0.7*	4.6	0.5*
Direct vs. Indirect Average Absolute Difference	20.4		19.2		21.3	
Women - *Two years after graduation*						
Married	51.0	28.6	49.8	26.6	52.5	31.0
Single	36.6	70.3	37.6	72.4	36.8	68.4
Other	12.4	1.1*	12.6	1.1*	10.7	0.6*
Direct vs. Indirect Average Absolute Difference	22.5		23.2		21.1	
Men vs. Women Average Absolute Difference	*6.2*	*3.8*	*7.9*	*3.9*	*6.6*	*6.9*
Marital Status	**1987**		**1991**		**1995**	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Five years after graduation*						
Married	64.3	48.7	57.8	46.1	63.9	46.2
Single	31.2	50.0	38.7	52.9	31.6	52.6
Other	4.5	1.4*	3.5*	1.0*	4.5	1.2*
Direct vs. Indirect Average Absolute Difference	12.5		9.5		14.0	
Women - *Five years after graduation*						
Married	59.7	51.6	63.1	54.5	65.6	54.9
Single	28.6	45.7	26.9	43.9	24.8	42.7
Other	11.8	2.7	10.0	1.6*	9.6	2.4
Direct vs. Indirect Average Absolute Difference	11.4		11.4		12.0	
Men vs. Women Average Absolute Difference	*4.9*	*2.8*	*7.9*	*6.0*	*4.6*	*6.6*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent.

Table 6 **Distribution of People with Children by Gender and Study Path**

Parental Status	1984		1988		1992	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Two years after graduation*						
No children	70.3	96.1	72.1	96.5	71.6	96.7
Presence of children	29.8	3.9	27.9	3.5	28.4	3.3
Direct vs. Indirect Average Absolute Difference	25.9		24.4		25.2	
Women - *Two years after graduation*						
No children	61.4	96.2	62.1	96.1	62.4	96.2
Presence of children	38.6	3.8	37.9	4.0	37.6	3.8
Direct vs. Indirect Average Absolute Difference	34.8		33.9		33.8	
Men vs. Women Average Absolute Difference	*8.9*	*0.1*	*10.0*	*0.5*	*9.2*	*0.5*
Parental Status	**1988**		**1991**		**1995**	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Five years after graduation*						
No children	58.3	82.0	61.4	85.0	58.7	85.0
Presence of children	41.7	18.0	38.6	15.0	41.2	14.9
Direct vs. Indirect Average Absolute Difference	23.7		23.6		26.3	
Women - *Five years after graduation*						
No children	55.7	84.1	56.8	81.8	52.9	79.5
Presence of children	44.3	15.9	43.2	18.2	46.7	20.2
Direct vs. Indirect Average Absolute Difference	28.4		25.0		26.6	
Men vs. Women Average Absolute Difference	*2.6*	*2.1*	*4.7*	*3.2*	*5.7*	*5.4*

4.3 Ongoing Education

Looking at continuing educational activities following graduation, direct students were more likely to be attending school at the time of each survey or to have attained an additional degree or diploma, as shown in tables 8 and 9. The only exceptions were among men from the 1982 cohort who were attending school or who had obtained a new diploma in or by 1984 (1982 cohort), and women in the 1990 cohort, among whom those from the indirect path were more likely to be in school five years after graduation (1995) that their direct counterparts. These may be aberrations

due to small sample sizes in these cells. The additional degree/diploma variable, shown in Table 8, is a better measure since it is not dependent upon finding the respondent attending school. On average, direct students are about 40 percent more likely than indirect students to have achieved certification beyond their bachelor's degree (varying from a low of 15 percent to a high of 60 percent). The gap persists across cohorts, survey occasions and gender.

Table 7 **Distribution of Peole Sill in School by Gender and Study Path**

School Status	1984		1988		1992	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Two years after graduation*						
Not in school	95.2	90.4	39.0	91.1	95.5	91.7
Still in school	4.8	9.6	7.0	8.9	4.5	8.3
Direct vs. Indirect Average Absolute Difference	4.8		1.9		3.8	
Women - *Two years after graduation*						
Not in school	95.7	93.1	95.1	90.2	95.3	92.7
Still in school	4.3	6.9	4.9	9.8	4.7	7.3
Direct vs. Indirect Average Absolute Difference	2.6		5.0		2.6	
Men vs. Women Average Absolute Difference	*0.5*	*2.7*	*2.1*	*0.9*	*0.2*	*1.0*
School Status	**1987**		**1991**		**1995**	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Five years after graduation*						
Not in school	96.9	93.7	97.7	94.7	99.5	99.9
Still in school	3.1	6.3	2.3*	5.3	---	---
Direct vs. Indirect Average Absolute Difference	3.2		3.0		0.4	
Women - *Five years after graduation*						
Not in School	96.8	94.2	98.0	96.7	97.3	98.5
Still in School	3.2	5.8	2.0*	3.3	2.7*	1.5*
Direct vs. Indirect Average Absolute Difference	2.6		1.3		1.2	
Men vs. Women Average Absolute Difference	*0.2*	*0.5*	*0.3*	*2.1*	*2.1*	*1.4*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent. Dashes (---) indicate data that cannot be reported because the CV is above 33 percent.

When controlling for indirect/direct student status, as shown in Table 9, there are no persistent gender differences in additional diploma attainment. Men have higher levels of attainment at a few points, women at a few others. However, at most points – particularly in the most recent cohort – the male and female rates are nearly equal. That is not to say that there is perfect gender equality in further degree attainment. However the small imbalances that do exist at the overall level can be attributed to the greater proportion of women in the indirect group.

Table 8 **Distribution of People Having Obtained a New Diploma by Gender and Study Path**

	1984		1988		1992	
New Diploma Status	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Two years after graduation*						
No new diploma	82.4	83.1	89.5	85.8	87.5	83.3
Obtained new diploma	17.6	16.9	10.5	14.2	12.5	16.7
Direct vs. Indirect Average Absolute Difference	0.7		3.7		4.2	
Women - *Two years after graduation*						
No new diploma	84.2	78.4	87.8	82.4	86.6	83.0
Obtained new diploma	15.8	21.7	12.2	17.6	13.4	17.0
Direct vs. Indirect Average Absolute Difference	5.8		5.4		3.6	
Men vs. Women Average Absolute Difference	*1.8*	*4.7*	*1.7*	*3.5*	*0.9*	*0.3*
	1987		**1991**		**1995**	
New Diploma Status	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Five years after graduation*						
No new diploma	83.5	74.7	91.6	91.1	84.7	74.8
Obtained new diploma	16.5	25.3	8.4	8.9	15.3	25.3
Direct vs. Indirect Average Absolute Difference	8.8		0.5		10.0	
Women - *Five years after graduation*						
No new diploma	85.8	81.9	91.9	88.9	83.5	74.8
Obtained new diploma	14.2	18.1	8.1	11.1	16.5	25.2
Direct vs. Indirect Average Absolute Difference	4.0		3.0		8.7	
Men vs. Women Average Absolute Difference	*2.3*	*7.1*	*0.3*	*2.1*	*1.2*	*0.1*

Table 9 **Percent of Population with a New Diploma Who Are Indirect Graduates by Gender and Study Path**

	Two Years After Graduation					
	1984		**1988**		**1992**	
New Diploma Status	Male	Female	Male	Female	Male	Female
No New Diploma	36.8	41.8	36.2	40.2	40.4	43.2
Obtained New Diploma	37.9	32.8	28.7	30.4	32.6	36.4
Total	36.9	40.1	35.2	38.6	39.2	42.1
	Five Years After Graduation					
	1988		**1991**		**1995**	
New Diploma Status	Male	Female	Male	Female	Male	Female
No New Diploma	39.1	40.4	34.3	39.3	42.4	44.9
Obtained New Diploma	27.3	33.6	32.8	31.3	28.2	32.3
Total	36.5	39.2	34.2	38.5	39.4	42.2

4.4 Differences in Labour Force Status

When we shift our focus to labour force status, there is a clear connection to the further degree attainment for men but not for women. That is, men who followed the direct path to graduation are more likely to be out of the labour force two years out and five years out than their counterparts who took the indirect route. This is undoubtedly a direct consequence of the greater proportion of direct students who pursue further studies. Accordingly, the differences diminish somewhat between the first and second survey occasions within each cohort. Also, there has been a trend for the gap to diminish across cohorts.

Among women, there is almost no difference in labour market participation between the direct and indirect groups. Thus the family responsibilities of both indirect and direct female graduates (note the rates of becoming mothers indicated in Table 1) may overlay any potential differences resulting from their differing rates of further study.

The similar continuing education activities of male and female direct students in the first two years following graduation seem to shape their labour market activities: their rates of being not in the labour force differ by approximately one percent in 1984, 1988 and 1992. By five years after graduation, a small gap in non-participation does appear between men and women in this group, but it is still only 1.3 percent in each cohort. In contrast, women in the indirect group have

higher non-participation rates than men, both two years and five years after graduation. However, since the participation rate of indirect women is increasing from cohort to cohort, while the participation rate of men is fairly constant, the gap is narrowing over time.

Table 10 **Labour Force Status Distribution by Gender and Study Path**

Labour Force Status	1984		1988		1992	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Two years after graduation*						
Employed	86.2	81.0	83.6	80.4	85.3	81.2
Unemployed	8.7	9.5	9.5	10.9	10.1	10.7
Not in labour force (non-participation)	4.8	9.4	6.0	8.4	4.6	8.0
Direct vs. Indirect Average Absolute Difference	3.5		2.3		2.7	
Women - *Two years after graduation*						
Employed	82.3	80.9	82.3	82.1	81.9	82.5
Unemployed	7.6	10.4	8.7	9.0	10.2	10.3
Not in labour force (non-participation)	9.6	8.5	8.0	8.6	7.9	7.2
Direct vs. Indirect Average Absolute Difference	1.8		0.4		0.5	
Men vs. Women Average Absolute Difference	*3.3*	*0.6*	*1.3*	*1.3*	*2.3*	*0.8*
Labour Force Status	**1987**		**1991**		**1995**	
	Indirect	Direct	Indirect	Direct	Indirect	Direct
Men - *Five years after graduation*						
Employed	92.5	88.3	88.3	87.6	91.5	90.0
Unemployed	3.5*	3.7	8.0	6.8	5.1	5.9
Not in labour force (non-participation)	3.5*	7.6	3.7*	5.7	3.4	4.1
Direct vs. Indirect Average Absolute Difference	2.8		1.3		0.9	
Women - *Five years after graduation*						
Employed	87.1	87.2	86.2	87.1	86.6	89.8
Unemployed	3.6	3.7	5.6	6.0	5.2	5.2
Not in labour force (non-participation)	8.8	8.9	8.3	6.9	8.3	5.0
Direct vs. Indirect Average Absolute Difference	0.1		0.9		2.2	
Men vs. Women Average Absolute Difference	*3.6*	*0.8*	*3.0*	*0.8*	*3.3*	*0.6*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent.

4.5 Occupational Distribution

The greatest difference between the direct and indirect groups, both for men and women, is the higher percentage of indirect graduates in "other teaching" occupations (mainly elementary and secondary school teaching). On average, well over one quarter of the women and roughly 15 percent of men in the indirect group are found in "other teaching." Note that a greater proportion of graduates are in teaching occupations than graduated with education diplomas. This discrepancy could result both from graduates of other fields of study going on to get an education degree and older teachers with only a teaching certificate going back to get the now required BA.

Among men, the major offsetting differences are higher proportions of direct graduates found in " architecture and engineering " occupations and "managerial related" occupations (e.g. accountants and auditors) and occupations related to the maths and sciences.

Among women, the offsetting differences are more evenly spread across the whole range of occupations. A couple of occupation groups – "sales" and "nursing and other health" – consistently employ a somewhat higher percentage of direct female graduates compared to their indirect counterparts.

The occupational differences between men and women within both the indirect and direct groups are much greater than the differences between the study paths within genders. The greatest difference is in the much greater percentage of women in "other teaching" occupations. The difference ranges from nine to 16 percentage points, depending on the cohort and survey occasion. Women are also consistently more likely to be found in clerical occupations. Greater proportions of male graduates entering managerial, managerial-related, science-related, engineering and architecture, math and computer science and sales occupations offset this difference.

There are no strong time trends in the distributions of occupation for men and women. There is a weak tendency to convergence between the direct and indirect men.

Table 11 Occupational Distribution by Gender and Study Path, Two Years After Graduation

	1984		1988		1992	
	Indirect	*Direct*	*Indirect*	*Direct*	*Indirect*	*Direct*
Men – *Occupation*						
Managers	10.4	7.5	8.3	9.6	9.3	7.2
Managerial Related	7.5	8.9	8.0	10.9	8.0	10.5
Physical & Life Sciences	1.7*	2.8	3.1*	2.6	1.3*	1.6
Architecture & Engineering	6.6	12.1	7.7	11.8	5.6	9.1
Math & Computer Science	3.7	6.0	5.5	7.8	5.2	6.4
Social Sciences & Religion	9.9	7.2	5.3	4.6	11.1	5.4
University Teaching	1.2*	1.6	2.5*	2.7	1.6*	2.3
Other Teaching	18.3	7.5	14.9	7.7	14.8	9.0
Health Diagnosis	4.4	3.2	---	0.7*	2.9	2.4
Nursing, Other Health	1.7*	2.1	1.9*	1.8*	1.9*	1.8
Arts & Recreation	3.3*	2.7	3.4*	2.6	2.9*	2.6
Clerical	3.1*		5.6	5.0		5.4
Sales	5.4	5.9	6.1	7.4	4.9	7.7
Service Occupations	3.1	2.8	3.4*	3.2	4.7	3.7
Blue Collar	6.3	7.6	7.2	6.0	6.2	6.2
Not Specified	13.5	17.9	16.8	15.5	14.4	18.5
Direct vs. Indirect Average Absolute Difference	2.3		1.6		1.9	
Women – *Occupation*						
Managers	4.7	5.3	7.5	7.0	7.3	6.8
Managerial Related	6.0	7.3	6.6	9.3	6.1	8.0
Physical & Life Sciences	0.7*	1.6	0.7*	1.3*	0.7*	1.5
Architecture & Engineering	---	1.2*	1.1*	2.1	0.8*	1.7
Math & Computer Science	1.4*	2.2	2.2*	2.9	1.7*	1.8
Social Sciences & Religion	9.9	7.6	8.4	6.6	10.4	7.8
University Teaching	---	1.7	1.5*	2.1	1.1*	1.7
Other Teaching	31.9	21.4	27.3	20.1	28.2	20.4
Health Diagnosis	2.0	1.8	---	0.5*	1.7	2.1
Nursing, Other Health	6.7	9.9	7.1	9.1	8.1	8.6
Arts & Recreation	2.8*	3.3	3.1*	3.0	2.7	3.0
Clerical	8.4	10.5	10.1	11.5	7.3	9.6
Sales	1.7*	3.6	2.3*	4.9	2.7	4.5
Service Occupations	1.3*	2.7	2.0*	3.4	2.7	3.9
Blue Collar	1.3*	1.8*	1.5*	1.3*	0.9*	1.5*
Not Specified	18.3	18.0	18.3	14.9	17.6	17.1
Direct vs. Indirect Average Absolute Difference	2.3		1.6		1.9	
Men vs. Women Average Absolute Difference	*3.8*	*3.6*	*3.3*	*3.6*	*3.1*	*3.2*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent. Dashes (---) indicate data that cannot be reported because the CV is above 33 percent.

Table 12 Occupational Distribution by Gender and Study Path, Five Years After Graduation

	1987		1991		1995	
	Indirect	*Direct*	*Indirect*	*Direct*	*Indirect*	*Direct*
Men – *Occupation*						
Managers	15.6	12.3	12.9	13.5	12.1	12.3
Managerial Related	8.1	10.0	9.0	11.8	8.1	13.1
Physical & Life Sciences	1.4*	2.8	1.9*	2.8	1.4*	2.1
Architecture & Engineering	6.4	12.4	8.2	11.6	6.5	9.2
Math & Computer Science	4.3	6.0	7.0	8.3	5.5	6.7
Social Sciences & Religion	11.0	9.2	6.6	5.9	11.6	6.7
University Teaching	2.0*	1.7*	3.0*	2.4	0.9*	1.5*
Other Teaching	19.6	9.6	16.8	8.8	16.6	11.6
Health Diagnosis	4.1	4.7	1.0*	1.9	3.5	3.5
Nursing, Other Health	1.5*	1.8*	1.8*	1.8*	1.8*	2.3
Arts & Recreation	3.7*	3.4	2.3*	2.6*	3.0*	3.5
Clerical	3.7*	3.6	4.4*	3.6	3.9*	3.4
Sales	5.3	6.2	7.0	7.9	4.8	7.3
Service Occupations	2.1*	1.5*	2.4*	2.5	4.6	2.3*
Blue Collar	4.6	4.8	5.8	4.8	7.0	4.6
Not Specified	6.8	10.2	10.1	9.8	8.9	10.0
Direct vs. Indirect Average Absolute Difference	2.0		1.4		1.9	
Women – *Occupation*						
Managers	7.1	7.7	11.2	8.2	10.1	9.9
Managerial Related	6.8	8.7	7.0	9.8	7.2	9.6
Physical & Life Sciences	0.8*	1.7	---	1.6	0.8*	1.6
Architecture & Engineering	0.6*	1.6*	1.3*	1.9	1.1*	1.9
Math & Computer Science	1.7*	2.1	2.3*	2.9	1.3*	1.8
Social Sciences & Religion	10.8	8.4	9.0	9.6	11.3	9.6
University Teaching	2.5*	1.3*	1.8*	2.0*	1.0*	1.6*
Other Teaching	33.4	26.0	30.9	24.7	30.4	23.6
Health Diagnosis	1.7*	2.2	---	1.1*	1.8	2.6
Nursing, Other Health	6.7	9.6	7.5	9.7	7.6	10.2
Arts & Recreation	---	4.0	2.3*	2.9	2.7	2.7
Clerical	7.5	8.7	8.6	7.2	5.5	6.5
Sales	2.5*	3.5	1.7*	4.7	2.6	4.4
Service Occupations	1.1*	1.6*	1.7*	1.7*	2.1*	2.5
Blue Collar	1.1*	1.2*	---	1.0*	1.2*	1.1*
Not Specified	12.1	11.8	12.8	10.9	13.5	10.4
Direct vs. Indirect Average Absolute Difference	1.4		1.6		1.5	
Men vs. Women Average Absolute Difference	*5.3*	*1.6*	*2.8*	*1.1*	*4.6*	*0.4*

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent. Dashes (---) indicate data that cannot be reported because the CV is above 33 percent.

4.6 Earnings Differences

Although direct students are far more likely to enter high-earnings fields of study, indirect graduates have the higher earnings in the first years following graduation. Indirect male graduates earned from 8 to 17 percent more than direct graduates by two years after graduation. However, that gap narrowed by one to nine percentage points over the following three years within each cohort. Thus the earnings of direct graduates catch up to those of their indirect counterparts quite quickly. The same pattern is evident for women in these cohorts, although the gap between the indirect and direct groups tends to be a bit wider.

Table 13 **Average Earnings by Gender and Study Path, Two and Five Years After Graduation**

	Two Years After Graduation								
	1984			**1988**			**1992**		
Gender	Indirect	Direct	*Indirect/ Direct Ratio*	Indirect	Direct	*Indirect/ Direct Ratio*	Indirect	Direct	*Indirect/ Direct Ratio*
Men	38,654	32,986	***117.2***	35,305	32,623	***108.2***	36,617	31,682	***115.6***
Women	34,797	27,966	***124.4***	33,610	28,054	***119.8***	33,149	29,201	***113.5***
Female/Male Earnings Ratio	***90.0***	***84.8***		***95.2***	***86.0***		***90.5***	***92.2***	
	Five Years After Graduation								
	1988			**1991**			**1995**		
Gender	Indirect	Direct	*Indirect/ Direct Ratio*	Indirect	Direct	*Indirect/ Direct Ratio*	Indirect	Direct	*Indirect/ Direct Ratio*
Men	46,752	42,885	***109.0***	40,680	40,457	***100.6***	42,933	40,183	***106.8***
Women	38,290	34,080	***112.4***	36,646	33,913	***108.1***	36,803	34,650	***106.2***
Female/Male Earnings Ratio	***81.9***	***79.5***		***90.1***	***83.8***		***85.7***	***86.2***	

Table 14 **Earnings Ratios of Direct to Indirect Graduates by Gender and Field of Study, Two and Five Years After Graduation**

	Two Years after Graduation			Five Years after Graduation		
	1982	*1986*	*1990*	*1982*	*1986*	*1990*
Men – *Field of Study*						
Unknown	82.8	92.2	75.3	111.0*	95.5	81.0
Education	83.6	89.1	88.0	91.0	90.9	94.9
Fine arts and humanities	86.2	95.1	90.9	95.3	99.4	95.8
Commerce, law and economics	91.5	100.1	92.5	96.4	100.9	95.8
Other social sciences	87.7	90.8	95.3	94.1	97.5	98.7
Agriculture and biological sciences	97.6	97.9	92.9	95.0	100.3	98.2
Engineering	99.7	99.4	98.9	99.5	100.1	100.8
Medical and health professions	100.4	97.2	94.4	94.5	95.5	90.9
Mathematics and physical sciences	97.2	97.6	96.8	96.1	100.0	98.9
All fields	***93.9***	***97.3***	***94.1***	***96.8***	***99.8***	***97.4***
Women – *Field of Study*						
Unknown	67.7	83.4	63.0	94.3*	89.8	80.5
Education	87.2	88.1	92.4	92.0	92.7	94.6
Fine arts and humanities	87.4	93.5	95.2	94.8	97.1	99.1
Commerce, law and economics	96.0	93.4	97.5	94.3	99.4	98.4
Other social sciences	85.2	90.4	91.2	91.3	95.5	95.7
Agriculture and biological sciences	99.8	99.6	95.7	100.2	99.3	101.9
Engineering	99.7	100.0	100.6	102.0	98.7	102.0
Medical and health professions	97.8	98.1	99.5	99.3	98.8	98.2
Mathematics and physical sciences	97.0	98.9	100.8	97.8	102.7	100.5
All fields	***91.2***	***93.2***	***94.6***	***95.4***	***97.1***	***97.5***

Note: Asterisk (*) stands for less reliable data, with a coefficient of variation (CV) between 16 and 33 percent.

When comparing the earnings of direct to indirect graduates within fields of study, similar patterns emerge among men and women. The larger gaps tend to be among the arts, humanities, and the 'other social sciences'. Earnings in the sciences, math, engineering, architecture, commerce, economics and law are very similar for direct and indirect graduates. Thus, it would seem that previous experience is more a factor in the earnings of the arts and humanities fields of study and less important in the more science-based or quantitative fields.

Table 15 **Female/Male Earnings Ratios by Study Path and Field of Study, Two and Five Years After Graduation**

	Two Years after Graduation			Five Years after Graduation		
	1982	*1986*	*1990*	*1982*	*1986*	*1990*
Indirect – *Field of Study*						
Unknown	106.3	97.2	138.9	102.0	95.5	115.1
Education	92.2	95.0	89.7	91.9	89.2	89.1
Fine arts and humanities	102.2	92.6	98.2	92.6	93.0	90.1
Commerce, law and economics	84.3	106.3	80.9	83.5	93.1	88.3
Other social sciences	96.5	93.4	92.9	95.9	96.2	89.4
Agriculture and biological sciences	87.7	92.4	82.8	80.5	91.4	70.6
Engineering	91.8	91.3	90.9	83.2	93.9	78.6
Medical and health professions	78.2	72.0	69.6	60.4	62.3	50.6
Mathematics and physical sciences	81.9	93.8	98.5	86.2	89.2	90.8
All fields	***90.0***	***95.2***	***90.5***	***81.9***	***90.1***	***95.7***
Direct – *Field of Study*						
Unknown	83.8	83.8	94.9	102.0	82.6	89.5
Education	99.5	88.0	92.7	91.0	90.9	87.3
Fine arts and humanities	111.0	89.3	98.3	99.5	88.8	89.1
Commerce, law and economics	95.1	86.9	90.6	89.3	88.9	83.2
Other social sciences	88.8	91.4	87.8	89.4	90.2	84.6
Agriculture and biological sciences	97.0	97.5	90.0	93.3	87.5	86.8
Engineering	98.3	93.4	89.6	90.3	88.6	90.6
Medical and health professions	87.8	73.9	64.6	71.0	69.7	57.5
Mathematics and physical sciences	93.5	97.7	96.8	91.0	96.9	95.0
All fields	***84.8***	***86.0***	***92.2***	***79.5***	***83.8***	***86.2***

No clear patterns are evident when looking at the gender earnings gap within field of study and study path. The gap is conspicuously large within the medical and health professions for both direct and indirect graduates, but this is mainly due to the aggregate nature of the group. This field includes nursing graduates (with smaller and slower growing earnings than the diagnostic professions), dragging down the earnings of women to a much greater extent than men.

5. Earnings Regressions

To account more fully for the many influences on post-graduation earnings and provide a more rigorous means of comparing earnings among direct/indirect and male/female graduates, a range of earnings regressions were estimated for each earnings measurement. These models include information on the major field of study, post graduation mobility, parents' postsecondary education, the use of student loans to support studies, marriage, presence of dependent children, home language, region of residence and full/part-time work status. Alternative models were also run for the 1986 and 1990 cohorts where hours of work were included instead of the full/part-time indicator. Each model, at each time point (two years and five years after graduation) for each cohort, was estimated for direct women, direct men, indirect women and indirect men.

Our intention here is not to get into a detailed discussion of the influences of the various factors on graduates' earnings. In this respect, our findings would not differ greatly from a number of recent NGS studies (Wannell and Caron, 1994a,b; Finnie and Wannell, 1999; Davies, Mosher and O'Grady, 1996, for example). Instead, we are interested in two more general questions. First, does the path followed through university affect post-graduation earnings? Second, given the homogenous path defined for the direct group, is the gender earnings gap smaller for that group than the indirect group? These questions were addressed by using the regression results to calculate Blinder-Oaxaca decompositions for indirect and direct graduates within gender and male graduates within study paths.

The Blinder-Oaxaca decomposition technique and several alternatives are discussed in some detail in Lavallée, Pereboom, Silver and Wannell (2000). For the purposes of this paper, a brief summary is more appropriate. The Blinder-Oaxaca decomposition is an algebraic technique used to divide the difference in earnings between two groups into two components:

1) *The Characteristics Component* represents the portion of the earnings differential due to differing characteristics between the two groups. For example, direct students tend to be more concentrated in high-earnings fields of study so one would expect their earnings to be concomitantly higher. This is a characteristics effect.

2) *The Coefficient Component* represents the portion of the earnings differential due to different estimated returns to like characteristics. So if direct students were estimated to get a bigger earnings boost from graduating with a math degree than indirect students, it would be a coefficient effect. In other words, the coefficient effect estimates the extent to which the labour market differentially rewards the characteristics of the two groups.

There is one methodological issue that should be recognized before discussing the results. Remember that the direct group was defined such that it is unlikely to include anyone with substantial full-time working experience prior to entering university. On the other hand, the indirect group is made of graduates with widely varying levels of pre-study work experience. Since the regression models do not include indicators of previous work experience, the positive earnings effects of experience would be captured solely by the intercept term. But the Blinder-Oaxaca method apportions differences in the intercept terms entirely to the coefficient component.[7] Therefore, the coefficient component is likely inflated in the direct-indirect comparisons due to this "missing variable" effect.

5.1 Direct to Indirect Decomposition Results

As shown in Table 16, the differences in earnings due to differences in how the market values characteristics is nearly always greater for women than men. The only exception was in the model including average hours in 1995. Remember that experience differentials would be picked up in the coefficient component and that experience differentials are probably greater for women than for men due to their more skewed age distribution. This seems a plausible explanation of the greater coefficient effect for women.

Within cohorts, the differences in market valuations (the coefficient effect) shrinks over time for both men and women. It even turns negative (i.e. in favour of direct graduates) for men in 1991. Thus the apparent earnings premium associated with of additional work or life experience for indirect graduates seem to erode over time, even though they remain substantial – particularly for women – five years after graduation.

[7] The intercept effect can be separated from the coefficient component. However, this is somewhat spurious since the intercept term also includes the "reference group" effects from each set of dummy variables. Consequently, the intercept effect is sensitive to the selection of these reference groups (see Jones (1983)).

Table 16 **Direct/Indirect Earnings Decomposition, Two and Five Years After Graduation**

	Two Years after Graduation			Five Years after Graduation		
	1982	*1986*	*1990*	*1982*	*1986*	*1990*
Model with Full-Time/Part-Time Variable						
Men - Characteristics	0.081	0.065	0.048	0.012	0.037	0.006
Men - Coefficients	0.077	0.019	0.073	0.050	-0.022	0.038
Women - Characteristics	0.041	0.050	0.019	-0.006	-0.005	-0.011
Women - Coefficients	0.169	0.099	0.097	0.112	0.056	0.057
	Two Years after Graduation			**Five Years after Graduation**		
	1988		*1992*	*1991*		*1995*
Model with Average Hours Variable						
Men - Characteristics	0.067		0.050	0.033		-0.003
Men - Coefficients	0.016		0.071	-0.021		0.046
Women - Characteristics	0.040		0.023	-0.013		0.011
Women - Coefficients	0.109		0.092	0.067		0.034

A similar pattern can be noted for the characteristics component – the portion of the earnings differential that can be attributed to differences in the levels of human capital an individual brings to the market. Differences due to amounts of human capital start out relatively small for women (both compared to the characteristics component for men and the coefficients component for women) and becomes negative or inconsequential five years out. Earnings differences due to differing amounts of human capital also drops for men from two to five years after graduation, remaining above one percent only in the 1986 cohort.

Thus we note a general convergence in both the characteristics and coefficients components for indirect relative to direct graduates. Although the earnings of indirect graduates always remain above the direct graduates at five years following graduation, it seems likely that the average trajectories cross at some later point.

Note that adding hours of work to the regression equation to replace full/part time status does not have much of an effect on the results of the direct to indirect decompositions. Thus when comparing the direct to indirect groups, the dichotomous full/part-time status variable performs similarly to actual hours of work

We interpret these results to mean that the greater average experience of indirect graduates is an important factor in explaining their higher earnings relative to their direct counterparts early in the post graduation careers. While we cannot control for any innate ability differences between direct and indirect graduates, labour market appears to see the greater age/experience of indirect graduates as an advantage over their direct counterparts. This additional value could be ascribed to some combination of expanded informal "job-finding networks" of indirect graduates or greater opportunities to integrate academic knowledge with practical implications or uses in the world of work. There is some evidence to suggest, however, that the higher valued degrees of the direct students will allow them to surpass their indirect classmates in the long run.

5.2 Female to Male Decomposition Results

The male-female earnings differential due to the coefficient effect is generally diminishing across cohorts, both for the direct and indirect groups, as shown in Table 17. As noted in Wannell and Caron (1994b), the decline is not monotonic: there is actually an upward blip from the 1982 to the 1986 cohort, followed by a steep drop in the 1990 cohort. The trend is basically flat for the characteristics component with a downward blip for the indirect group in the middle cohort. So even though the earnings related characteristics of men and women are not converging over time (i.e. from cohort to cohort), the estimated labour market valuation of like characteristics is getting closer and closer.

Gender differences are about on par with indirect-direct differences two years after graduation, but the gender gap grows substantially over the following three years in each cohort. Most of this growth in the gender earnings gap within cohorts is accounted for by a widening of the differential due to characteristics over time within cohorts. As was noted earlier, just the opposite happened in the direct/indirect decompositions: the characteristics component shrank over time within cohorts.

Table 17 **Female/Male Earnings Decomposition, Two and Five Years After Graduation**

	Two Years after Graduation			Five Years after Graduation		
	1982	*1986*	*1990*	*1982*	*1986*	*1990*
Model with Full-Time/Part-Time Variable						
Indirect - Characteristics	0.030	0.001	0.044	0.066	0.035	0.071
Indirect - Coefficients	0.052	0.063	0.025	0.073	0.079	0.054
Direct - Characteristics	0.060	0.045	0.057	0.081	0.082	0.088
Direct - Coefficients	0.073	0.085	0.008	0.102	0.068	0.038
	Two Years after Graduation			**Five Years after Graduation**		
	1988		*1992*	*1991*		*1995*
Model with Average Hours Variable						
Indirect - Characteristics	-0.009		0.063	0.033		0.079
Indirect - Coefficients	0.074		0.006	0.077		0.046
Direct - Characteristics	0.047		0.088	0.105		0.109
Direct - Coefficients	0.083		-0.024	0.048		0.018

Another difference between the direct/indirect decompositions and the gender decompositions is the effect of switching to actual hours of work rather than the full/part-time indicator. Adding the actual hours variable shifts more of the gender gap into the characteristics component. This is due to the fact that, on average, men work longer hours than women – something that cannot be fully captured by a simple full-time, part-time split. In the most recent cohort, the coefficient component (representing differential rewards to like characteristics) was negligible (for the indirect group) or negative (for the direct group). In other words, women in the direct study stream of the 1990 cohort were actually compensated at higher levels (by 2.4 percent) than men for like characteristics. However, the gap due to coefficients does turn in favour of men for the direct group in 1995 (at 1.8 percent).

Although we expected earnings-related characteristics to be generally smaller for the direct group, the characteristics component was consistently smaller for the indirect group. So there were greater earnings-related dissimilarities within the direct group (mostly related to chosen field of study) than in the apparently more heterogeneous (with respect to demographic characteristics) indirect group.

6. Conclusions

The research reflected in this paper attempts to distinguish between the typical route to an undergraduate degree and a more indirect path marked by part-time study, raising children, or graduation after the age of 25. With tuition costs rising faster than the overall inflation rate in recent years, there is a possibility that this could lead students to take the more indirect route to a university degree. Our central question is whether the indirect path is associated with notable disadvantages in labour market outcomes, and therefore raise additional concerns over rising tuition rates. We compare data on both men and women graduates using data from three panels of the National Graduates Surveys.

We began our analysis with a logistic model that estimated the relative importance of various factors that might influence whether graduates might take a direct or indirect path to a university degree. The results suggest that male students following an indirect path are more likely to have faced financial constraints as proxied by borrowing money to complete studies. Among women, however, those who pursued a *direct* path to a degree were more likely to have borrowed money. Further, we found that high educational attainment of parents is positively correlated with the direct study path, though we found a stronger, more consistent influence for women than men. Graduates in fields of study typically leading to high earnings were more likely to follow a more direct path to a degree. Students, both male and female, from Western Canada were more likely to pursue the indirect path, while language spoken at home did not seem to have a consistent influence on the path to a degree.

Our comparisons of direct versus indirect graduates showed the following differences:

- direct graduates were more likely to concentrate in quantitative fields of study while indirect graduates were more focused on the humanities and arts, with the pattern holding for both men and women.

- differences in marital and family status are clearly linked to the selection criteria underlying the direct/indirect distinction, so it comes as little surprise that the indirect group are more likely to be married and have children than the direct group, both two and five years after

graduation. Those following an indirect path to an undergraduate education were less likely to continue on to graduate study, both among men and women.

- Among both men and women, the indirect group was much more likely to be in teaching occupations, likely a consequence of regulatory changes that raised the educational requirement for teachers to a BA from a teaching certificate.

- Indirect graduates have considerably higher earnings than direct graduates two years after graduation, though the gap narrows during the two and five year post-graduation period. This pattern varies somewhat by occupation, with the more math-oriented fields of study showing less of an earnings penalty for direct graduates, and the "softer" fields apparently rewarding other forms of human capital gained via an indirect route to a degree.

The final section of the paper sought to decompose the earnings differences between the indirect and direct groups as well as the male/female differences. This analysis is complicated by the fact that the NGS offers little information on the work experience prior to graduation, meaning that the indirect group is more likely to have additional "unobserved" human capital relative to their counterparts in the direct group. The earnings trajectories of the two groups would appear to converge at some point beyond five years after graduation, as the experience advantage of indirect graduates diminishes in importance.

Both the direct and indirect paths to a degree show that, over time, the labour market is coming to value the characteristics of men and women more equally at the two-year observation point. On the other hand, for both direct and indirect graduates, the gender gap widens during the following three-year interval. Over time, however, even the gender gap evident five years after graduation appears to be shrinking, to roughly 5 percent for female indirect graduates relative to their male counterparts; and to roughly 4 percent for female direct graduates relative to their male counterparts.

Based on our analysis in this paper, there appears to be little economic penalty or public policy concern associated with pursuing an indirect route to an undergraduate degree instead of the more conventional direct route. Whatever additional human capital a person pursuing an indirect route to a degree obtains along the way appears to be compensated in the market.

More positively, those who are unable to follow a direct path to an undergraduate degree should not fear that they would be stigmatized in the labour market for not sticking to the straight and narrow path to an education.

The findings in this paper may support education policy that offers opportunities for work experience and working-world application of knowledge as well as traditional academic instruction. Students following an indirect path may benefit from additional work or life experience and opportunities to apply newly acquired knowledge in a work environment may be greater for those in the indirect path. Further, indirect graduates might benefit from expanded networks that allow a wider choice of employment at higher wages. Both the applied knowledge and the wider networks could represent additional human capital rewarded through higher wages in the early years after graduation. Extensions to the work in this paper could explore this line by comparing outcomes between cohorts that followed an indirect path with those in a direct path that included cooperative education or formal internship programs.

Our findings also suggest that though women were more likely to pursue an indirect path to an university education, this factor is likely to contribute to a closing of the gender gap. Labour market related characteristics of women who pursued an indirect path to a degree tended to be valued more highly by the labour market than their women who followed the direct route, though this premium seems to shrinking among cohorts over time. Again, the demonstration and network effects of the indirect paths may have the effect of demonstrating the value of human capital to employers, and this may reduce any bias against females on the part of employers.

The limitations to this analysis include the fact that we focus only on the first five years after graduation and do not take a lifetime returns perspective on the question of returns to investment in education. A lifetime returns perspective would place obvious limits on assertions that it doesn't really matter when you finish your degree. For example, if education were seen exclusively as an economic investment to generate higher earnings over a lifetime, it would make sense to earn the degree early, rather than five years before retirement.

Appendix

Occupation Coding

Table A **Occupation Groups**

Occupation Description	*Standard Occupation Classification(1980) Codes*
Managers	1111-1158
Managerial Related	1171-1179
Physical & Life Sciences	2111-2139
Architecture & Engineering	2141-2169
Math & Computer Science	2181-2189
Social Sciences & Religion	2311-2519
University Teaching	2711-2719
Other Teaching	2731-2799
Health Diagnosis	3111-3119
Nursing, Other Health	3130-3169
Arts & Recreation	3311-3379
Clerical	4110-4199
Sales	5130-5199
Service Occupations	6111-6199
Blue Collar	7113-9599
Not Specified	Less than 1111 or 9910 - 9919

References

Altonji, Joseph A. (1993). "The Demand for and Return to Education When Education Outcomes are Uncertain," *Journal of Labor Economics*, Vol. 10, pp. 48-83.

Berndt, Ernst R. (1991). *The Practice of Econometrics: Classic and Contemporary*. Addison Wesley Publishing Company.

Betts, Julian, Chris Ferrall and Ross Finnie (2000). *The Transition to Work for Canadian University Graduates: Time to First Job, 1982-1990*. Statistics Canada, Analytical Studies Branch Research Paper 141.

Blinder, Alan S. (1973). "Wage Discrimination: Reduced Form and Structural Estimates," *Journal of Human Resources*, Vol. 8, pp. 436-55.

Boulet, Jac-André and Laval Lavallée (1984). *The Changing Economic Status of Women*. Ottawa: Minister of Supply and Services Canada.

Boulet, Jac-André and Laval Lavallée (1981). *Women and the Labour Market: An Analytical Framework*. Ottawa: Economic Council of Canada, Discussion Paper 207.

Cain, Glen (1986). "The Economic Analysis of Labor Market Discrimination: A Survey," in Orley Ashenfelter and Richard Layard (eds.). *Handbook of Labor Economics*. Oxford: North-Holland. Chapter 13, Vol. 1, pp. 693-785.

Cameron, Stephen V. and James J. Heckman (1994). "Determinants of Young Males' Schooling and Training Choices," in Lisa M. Lynch (ed.). *National Bureau of Economic Research Comparative Labor Market Series: Training and the Private Sector*. The University of Chicago Press, pp. 201-31.

Chamberlain, Gary (1980). "Analysis of Covariance with Qualitative Data," *Review of Economic Studies*, Vol. 47, No. 1, pp. 225-38.

Christofides, L.N. and R. Swidinsky (1994). "Wage Determination by Gender and Visible Minority Status: Evidence from the 1989 LMAS," *Canadian Public Policy - Analyse de Politiques*, Vol. 20, No. 1, pp. 34-51.

Davies, Scott, Clayton Mosher and Bill O'Grady (1996). "Educating Women: Gender Inequalities Among Canadian University Graduates." *Canadian Review of Sociology and Anthropology*, Vol. 33, No. 2, p. 125.

de Broucker, Patrice and Laval Lavallée (1998a). "Getting Ahead in Life: Does your parents' education count?" *Education Quarterly Review*, Vol. 5, No. 1, pp. 22-8. Ottawa: Statistics Canada, Catalogue No. 81-000-XPB (also in *Canadian Social Trends*, Summer Vol. 11, No. 5, Catalogue No. 81-000-XPB).

de Broucker, Patrice and Laval Lavallée (1998b). "Intergenerational Aspects of Education and Literacy Skills Acquisition," in Miles Corak (ed.). *Labour Markets, Social Institutions, and the Future of Canada's Children*. Ottawa: Statistics Canada, Catalogue No. 89-553-XPB. November, pp. 129-43.

de Silva, Arnold (1997). "Wage Discrimination Against Visible Minority Men in Canada." *Canadian Business Economics*, Summer, Vol. 5, No. 4, pp. 25-42.

DiNardo, John and Thomas Lemieux (1997). "Diverging Male Wage Inequality in the United States and Canada, 1981-1988: Do Institutions Explain the Difference," *Industrial and Labor Relations Review*, Vol. 50, pp. 629-51.

Dolton, P.J. and G.H. Makepeace (1987). "Interpreting Sample Selection Effects," *Economic Letters*, Vol. 24, pp. 373-9.

Ehrenberg, Ronald and Robert S. Smith (1985). *Modern Labor Economics: Theory and Public Policy*. Glenview, Illinois: Scott, Foresman and Company.

Finnie, Ross (1999a). *Earnings of Post-Secondary Graduates in Canada: Holding Their Own: Trends in Employment Rates and Earnings Levels*. Research paper R-99-12E.a, Applied Research Branch, Strategic Policy, Human Resources Development Canada.

Finnie, Ross (1999b). *Earnings of Post-Secondary Graduates in Canada: Changes in the Structure of Earnings in the 1980s and 1990s*. Research paper R-99-12E.b, Applied Research Branch, Strategic Policy, Human Resources Development Canada.

Finnie, Ross (1999c). *A Dynamic Analysis of the School-to Work Transition of Post-Secondary Graduates in Canada*. Research paper R-99-14E, Applied Research Branch, Strategic Policy, Human Resources Development Canada.

Finnie, Ross (1999d). "Post-secondary Graduates: Holding Their Own in Terms of Employment Rates and Earnings Patterns." *Canadian Business Economics*, December, pp. 48-64.

Finnie, Ross and Ted Wannell (1999). "The Gender Earnings Gap Amongst Canadian Bachelor's Level University Graduates: A Cross-Cohort, Longitudinal Analysis," in *Women and Work*, Richard Chaykowski and Lisa Powell (eds.). Kingston, Ontario: Queen's-McGill University Press.

Fortin, Nicole M., John DiNardo and Thomas Lemieux (1996). "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach," *Econometrica*, Vol. 64, pp. 1001-44.

Goldberger, Arthur S. (1984). "Reverse Regression and Salary Discrimination," *Journal of Human Resources*, Vol. 19, No. 3.

Griliches, Zvi, Bronwyn H. Hall and Jerry A. Hausman (1978). "Missing Data And Self-Selection in Large Panels," *Annales de L'INSEE*, Vol. 30-31, pp. 137-76.

Hillmer, Michael (1999a). *Human Capital Attainment, University Quality, and Entry-Level Wages for College Transfer Students*. Department of Economics, Univeristy of Louisville, Kentucky.

Hillmer, Michael (1999b). *Is Two-Year College Attendance a Good Initial Investment for Students Who Persist in a Baccalaureate Degree?* Department of Economics, Univeristy of Louisville, Kentucky.

Hirsch, Barry T. and Karen Leppel (1992). "Sex Discrimination in Faculty Salaries," *Journal of Applied Econometrics*, Vol. 7, pp. 413-21.

Hum, Derek and Wayne Simpson (1998). *Wage Opportunities for Visible Minorities in Canada*, SLID Working Papers 98-17. Ottawa: Statistics Canada.

Interdepartmental Working Group on Employment Equity Data (1993). *Women, Visible Minorities, Aboriginal people and Persons with Disabilities: The 1991 Employment Equity Definitions*. Ottawa: The Interdepartmental Working Group on Employment Equity Data. December.

Jackson, John D. and James T. Lindley (1989). "Measuring the Extent of Wage Discrimination: A Statistical Test and a Caveat," *Applied Economics*, Vol. 21, pp. 515-40.

Jakubson, George (1986a). *Estimation and Testing of Fixed Effect Models*. Working Paper 208, Princeton University, Industrial Relations Section.

Jakubson, George (1986b). *The Sensitivity or Individual Effects: Labor Supply Parameter Estimates of Unobserved Fixed and Random Effects Estimates in a Nonlinear Model Using Panel Data*. Working Paper 210, Princeton University, Industrial Relations Section.

Jones, F.L. (1983). "On Decomposing the Wage Gap: A Critical Comment on Blinder's Method," *Journal of Human Resources*, Vol. 28, No. 1, pp. 126-30.

Killingsworth, Mark R. (1983). *Labor Supply*. New York: Cambridge University Press.

Lam, David and Suzanne Duryea (1999). "Effects of Schooling on Fertility, Labour Supply and Investments in Children, with Evidence from Brazil," *Journal of Human Resouces*, Vol. 35, No. 1, p. 160.

Lavallée, Laval, Bert Pereboom, Irving Silver and Ted Wannell (2000). *Employment-Equity Groups Among Post-Secondary Graduates*. Research paper R-00-1-3E, Applied Research Branch, Strategic Policy, Human Resources Development Canada.

Link, C.R. and E.C. Ratledge (1975). "The Influence of the Quantity and Quality of Education on Black-White Earnings Differentials: Some New Evidence," *Review of Economics and Statistics*, Vol. 57, pp. 346-350.

Maddala, G.S. (1983). *Limited-Dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.

Marsh, Herbert W. (1991). "Employment During High School: Character Builder or a Subversion of Academic Goals," *Sociology of Education*, Vol. 64, pp. 172-89.

Muzzer, Linda, Greg Brown and Roy Hornosty (1995). "Gender, Educational Credentials, Contributions and Career Advancement: Results of A Follow-Up Study in Hospital Pharmacy," *Canadian Review of Sociology and Anthropology*, May 1995, Vol. 32, No. 2, p. 151.

Oaxaca, Ronald (1973). "Male-Female Wage Differentials In Urban Labor Markets," *International Economic Review*, Vol. 14, pp. 693-709.

Racine, Jeff and Paul Rilstone (1995). "The Reverse Regression Problem: Statistical Paradox or Artefact of Misspecification?" *Canadian Journal of Economics*, Vol. 28, No. 3, pp. 502-31.

Ranson, Gillian (1998). "The Reverse Education, Work and Family Decision Making: Finding the Right Time to Have a Baby," *Canadian Review of Sociology and Anthropology*, Vol. 35, No. 4, p. 517.

Schultz, Paul and Germano Mwabu (1998). *Wage Premia for Education and Location, by Gender and Race in South Africa*. Discussion paper 785, Yale University Economic Growth Center, February.

Shaw, Kathryn (1994). "The Persistence of Female Labor Supply: Empirical Evidence and Implications," *The Journal of Human Resources*, Vol. 29, No. 2, pp. 348-378.

Silver, Irving, Laval Lavallée and Bert Pereboom (2000). *Labour Market Transitions of Graduates*. Applied Research Branch Research paper R-00-1-9E. Ottawa: Human Resources Development Canada and Statistics Canada.

Simpson, W. (1990). "Starting Even? Job mobility and the wage gap between young single males and females," *Applied Economics,* Vol. 22, pp. 723-37.

Statistics Canada (1993). *Health and Activity Limitation Survey – 1991 User's Guide*. Ottawa: Statistics Canada, Post-Censal Surveys Program.

Topel, Robert and Michael Ward (1992). "Job Mobility and the Careers of Young Men," *Quarterly Journal of Economics*, Vol. 107, pp. 439-80.

Vella, Francis (1998). "Estimating Models with Sample Selection Bias: A Survey," *Journal of Human Resources*, Vol. 33, No. 1, pp. 127-69.

Wannell, Ted and Nathalie Caron (1994a). *A Look at Employment-Equity Groups Among Recent Post-secondary Graduates: Visible Minorities, Aboriginal People and the Activity-Limited.* Research Paper No. 69. Ottawa: Statistics Canada, Analytical Studies Branch, November.

Wannell, Ted and Nathalie Caron (1994b). *The Gender Earnings Gap Among Recent Post-secondary Graduates, 1984-92*. Research Paper No. 68. Ottawa: Statistics Canada, Analytical Studies Branch, November.

Weiss, Andrew (1988). "High School Graduation, Performance and Wages," *Journal of Political Economy*, Vol. 96, pp. 785-820.